8 UNAVOIDABLE/IRREVERSIBLE IMPACTS

Impacts that cannot be avoided by reasonable mitigation measures are described in Section 8.1; these impacts are based on the reference case (direct discharge to Steel Creek). Impacts that differ from those caused by the preferred cooling alternative (described in Chapter 4 and Appendix L) are noted. AM-5, Other individual mitigation alternatives would have smaller unavoidable and irreversible impacts. FR-27 Section 8.2 describes commitments of resources and Section 8.3 outlines short-term versus long-term implications.

8.1 UNAVOIDABLE ADVERSE IMPACTS

The unavoidable adverse impacts expected from the resumption of L-Reactor operation have all been experienced previously to either the same or a greater extent during the past operation of L-Reactor.

An additional 11 cubic meters per second of cooling water would be withdrawn from the Savannah River. This withdrawal would cause entrainment and impingement of aquatic biota (Section 5.2.4). The resumption of direct discharges of thermal effluents from reactor operation to Steel Creek (reference case) would impact between 730 and 1000 acres of wetlands and the wildlife supported by this habitat. Some habitat for the American alligator, waterfowl, and wood stork would be eliminated. The preferred cooling alternative would impact between 735 and 1015 acres of wetlands and 875 acres of uplands. Some habitat for AM-5, the alligator, waterfowl, wood stork, and other wildlife would also be FR-27 eliminated.

For the reference case, the use of Steel Creek above its delta by fish would be significantly reduced. During the months of March, April, and May, thermal effluents from Steel Creek would block fish access to Boggy Gut Creek wetland areas (230 acres) and prevent spawning in this offsite creek. Thermal discharges would also increase the thermal plume in the Savannah River; however, a zone of passage for fish would be maintained. The impacts would be reduced with the preferred (1000-acre lake) cooling alternative, although the headwaters of Steel Creek would not always be available to fish. During winter, the temperature of Steel Creek below the embankment would be 7° to 9°C above ambient, AM-5, leading to the possibility of cold shock. However, reactor shutdowns during the FR-27 winter would result in gradual heat loss in this area, which would minimize any cold shock effects. Aquatic biota would be able to utilize the swamp and delta for spawning and feeding purposes.

Unavoidable radiation exposure would include increased occupational exposures and exposures to the general public due to normal reactor operations, and the resuspension of radiocesium and cobalt-60 from Steel Creek. The occupational and public exposures (Section 4.1.2) would be minimal compared to those from natural and other manmade radiation sources.

8.2 IRREVERSIBLE AND/OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

Energy, raw material, and other resources would be consumed in the operation of L-Reactor. Resources that could be irreversibly or irretrievably committed during operation of facilities include (1) materials that cannot be recovered or recycled, and (2) materials consumed or reduced to unrecoverable forms.

Resumption of L-Reactor operation would involve only land previously committed. However, final disposal of low-level radioactive waste associated with L-Reactor operation would probably involve additional land use (ERDA, 1977).

Irretrievable energy use would amount to 40-50 megawatt-years of electricity per year, 5.8×10^3 metric tons of coal per year, and 1.5×10^6 liters of diesel fuel per year. Additionally, process chemicals would be consumed and/or converted to unrecoverable forms. Other irretrievable resources would include contaminated materials and/or equipment that could not be reused.

8.3 SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

The short-term effects of L-Reactor operation include the unavailability of site areas for their natural productivity and wildlife habitat. However, this area has been committed for energy and defense activities since 1951. Following decommissioning and decontamination (Section 4.6), this area can revert back to its natural state with minimal long-term effects.

In the short term, L-Reactor operation would impact wetlands, wetlands habitat, and aquatic biota due to cooling-water withdrawal and thermal effluent discharge. There would be loss of a portion of local habitat for endangered species (e.g., the American alligator, and the wood stork). In the long term,
AM-5, FR-27 after termination of L-Reactor operation, wetlands below the cooling lake embankment could become established through the process of natural succession. Emergent, nonwoody hydrophytes could become reestablished within months, depending upon the season when flow is terminated, and other habitat factors. Vegetation characteristic of bottomland and swamp wetlands would take longer. In 1981, 13 years after the shutdown of L-Reactor, the Savannah River swamp had only begun to return to its former composition and structure (Repaske, 1981).
AM-5, FR-27 The 1000-acre lake would provide habitat for aquatic and semiaquatic biota.

Solid nonradioactive waste generated from L-Reactor would use additional land at a landfill site that will be unavailable for alternative uses. Additional space would be required at an already designated burial ground site for radiological solid waste generated by L-Reactor.

High-level radioactive waste from L-Area would require additional waste processing (DOE, 1982) and disposal in a geologic repository with the commitment of associated land and other resources.

REFERENCES

DOE (U.S. Department of Energy), 1982. Final Environmental Impact Statement, Defense Waste Processing Facility, Savannah River Plant, DOE/EIS-0082, Aiken, South Carolina.

ERDA (Energy Research and Development Administration), 1977. Final Environmental Impact Statement, Waste Management Operations, Savannah River Plant, ERDA-1537, Aiken, South Carolina.

Repaske, W. A., 1981. Effects of Heated Water Effluents on the Swamp Forest at the Savannah River Plant, South Carolina. Master Thesis, University of Georgia, Athens, Georgia.